

REMARKS

Claims 2-5, 7, 10, 14, 17, 18 and 21 are pending in the present application. Claims 6, 8, 9, 11-13, 15, 16, 19 and 20 have been canceled. Claim 1 was previously canceled. Claims 10, 14, 17 and 21 have been amended.

Applicant respectfully requests reconsideration of the application in view of the foregoing amendments and the remarks appearing below, which Applicant believes places the application into condition for allowance.

Rejection Under 35 U.S.C. § 112, First Paragraph

Claims 2-7, 10-14, 17-19 and 21 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, it is asserted that the amended claims use the term “microelectronics wafer,” whereas neither the specification nor drawings support this terminology. Applicant respectfully disagrees.

As stated in the rejection, the measure for determining whether added terminology supports the written description requirement is whether the subject of the terminology was described in the specification in such a way as to reasonably convey to one skilled in the relevant art had possession of the claimed invention at the time the application was filed. Applicant respectfully asserts that the term “microelectronics wafer” clearly meets this criteria.

For example, paragraph [0014] of the specification as originally filed clearly describe a semiconductor wafer (24) containing a plurality of integrated circuits (28). It is common knowledge of anyone skilled in the art that semiconductor wafers containing integrated circuits are also called “microelectronics wafer.” Indeed, an entry for “microelectronics” in the online dictionary Encarta defines “microelectronics” as “the technology and techniques involved in the design, development, and construction of extremely small electronic circuits such as computers on a single silicon chip.” (Emphasis added.) Applicant respectfully submits that anyone skilled in the art will understand that, despite the term “microelectronics wafer” not being explicitly used in the original filing, the present invention is applicable to microelectronics wafers. Indeed the primary example is particularly directed to a microelectronics wafer, i.e., a semiconductor wafer containing integrated circuits.

For at least the foregoing reasons, Applicant asserts he was in possession of the invention now being claims. Therefore, Applicant respectfully requests withdrawal of the present rejection.

Rejections Under 35 U.S.C. § 102

Kitamura et al.

Claims 6 and 21 stand rejected under 35 U.S.C § 102(b) as being anticipated by U.S. Patent No. 5,508,879, issued to Kitamura et al., on the assertion that Kitamura et al. disclose all of the limitations of these claims. Applicant respectfully disagrees.

Kitamura et al. disclose a charge removal brush for removing charges from transfer drums and papers in a Xerography image-forming apparatus, such as a copying machine and a printer, and from residual toner from the photoreceptor in the cleaning unit in the same apparatus.

Claim 6 has been canceled, so the present rejection is moot for this claim. However, claim 21, even prior to the current amendment, is directed to an apparatus for cleaning surface contaminants from a microelectronics wafer and that includes, among other things, a wafer cleaning region and a conductive rotating wafer-cleaning member. Since the Kitamura et al. patent is directed to a completely different technology from wafer cleaning, it cannot reasonably be said that it discloses, explicitly or inherently, a wafer cleaning apparatus and the various claimed components of such an apparatus. Since an anticipation rejection generally requires that a single reference disclose all elements of a claim, and since Kitamura et al. clearly do not disclose all of the elements of claim 21, the Kitamura et al. patent cannot anticipate claim 21.

In the response to Applicant's arguments on page 9 of the present Office Action, it is argued that the language regarding cleaning a microelectronics wafer in claim 21 is merely a recitation of intended use. Further, the Office Action asserts that the Kitamura et al. apparatus is clearly capable of being used to clean a microelectronics wafer. Applicants respectfully assert that neither of these positions is correct under the applicable law.

Regarding claim 21 merely reciting microelectronics wafer cleaning as an intended use, claim 21, in its body, recites "a wafer cleaning region configured to receive a microelectronics wafer during cleaning." The Kitamura et al. printer/copier certainly does not have this element. The paper used with the Kitamura et al. printer/copier is much different in character than a

microelectronics wafer, as anyone skilled in the art will attest. A microelectronics wafer simply cannot be run through a printer/copier.

In addition, claim 21 requires “a conductive rotating wafer-cleaning member designed to contact the microelectronics wafer during cleaning so as to remove surface contaminants from the microelectronics wafer during cleaning.” The Kitamura et al. printer/copier also does not have this element. As those skilled in the art know, wafer-cleaning members are highly engineered and cannot be replaced at will with a charge-removal brush from a printer-copier that is designed to do something completely different from cleaning a microelectronics wafer.

Regarding the Kitamura et al. apparatus being “clearly capable” of cleaning a microelectronics wafer, Applicant believes this is not so. As just discussed, a printer/copier does not have the physical features of a microelectronics wafer cleaning apparatus.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejections of claims 6 and 21.

Rejection Under 35 U.S.C. § 103(a)

Hawn/Kitamura et al.

Claims 2, 3, 6, 10-14, 17-19 and 21 stand rejected under 35 U.S.C § 103(a) as being obvious in view of a combination of Hawn IBM Technical Disclosure Bulletin and the Kitamura et al. patent, discussed above. Applicant respectfully disagrees.

The Hawn Bulletin describes removing unwanted electrostatic charges from photoconductive plates using a soft grounded brush with multiple conductive points that come into intimate contact with the surface being discharged.

The Kitamura et al. patent is as described above relative to the anticipation rejection. In addition, the Kitamura et al. charge removal brush includes a number of long, conductive filamentous elements for removing charges from an object when the charge removal brush comes in contact with the object, is disclosed. The charge removal brush includes a metal shaft rotatable about the axis thereof, a strip-like woven cloth including a base cloth and long conductive filamentous elements uniformly planted in the substantially entire surface of the base cloth, the strip-like woven cloth being spirally wound on the metal shaft with no gap, and a conductive fiber is woven into the base cloth in a state that the conductive fiber runs along the center line of the base cloth, which is extended in the lengthwise direction of the base cloth.

Of the rejected claims, claims 6, 11-14, 19 and 20 have been canceled. Therefore, the present rejection is moot relative to these claims.

Regarding the remaining ones of the rejected claims, each of these claims requires a “conductive rotating wafer cleaning member” designed to contact a microelectronics wafer so as to remove surface contaminants from the wafer. In this connection, the Office Action asserts that Hawn discloses a wafer cleaning apparatus. Applicant respectfully disagrees.

Hawn makes no mention whatsoever of the Hawn apparatus being an apparatus for cleaning surface contaminants from any article, let alone a microelectronics wafer. The only article Hawn mentions is a photoconductive plate, which is used in lithographic printing and has nothing to do with microelectronics wafers or their cleaning. Indeed, the Hawn Bulletin and the Kitamura et al. patent are drawn largely to the same subject matter. Importantly, neither of these references discloses or suggests cleaning of a microelectronics wafer, nor the claimed components of a microelectronics wafer cleaning apparatus. Therefore, with reasoning similar to the anticipation rejection in view of the Kitamura et al. patent, the combination of the Hawn Bulletin and Kitamura et al. patent cannot render obvious any of claims 2, 3, 10, 17, 18 and 21 that are directed to microelectronics wafer cleaning and apparatus and systems therefore.

For at least these reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Bahten/Hawn

Claims 2, 3, 6, 7, 10-14, 17-19 and 21 stand rejected under 35 U.S.C § 103(a) as being obvious in view of a combination of U.S. Patent No. 6,182,323 to Bahten and the Hawn Bulletin, discussed above. Applicant respectfully disagrees.

Bahten discloses porous polymeric scrubbing brushes for cleaning particulate contaminants from, among other things, microelectronics wafers. Bahten also discloses that these brushes are used in wafer cleaning apparatuses.

Again, Hawn discloses the removal of unwanted electrostatic charges from photoconductive plates using a soft grounded brush with multiple conductive points that come into intimate contact with the surface being discharged.

Of the rejected claims, claims 6, 11-14, 19 and 20 have been canceled. Therefore, the present rejection is moot relative to these claims.

Regarding the remaining ones of the rejected claims, each of these claims is directed to a method, apparatus or system for cleaning surface contaminant from microelectronic wafers. While the Bahten patent is generally directed to the same subject matter, Bahten does not so much as disclose or suggest that the Bahten scrubbing brushes are part of a grounding path. Hawn, in a completely different field of endeavor, i.e., lithographic printing, discloses the use of brushes for removing charges from photoconductive plates. As those skilled in the art readily appreciate, there are vast differences between the functions of the two types of brushes. Even assuming that the Hawn brushes are also designed for cleaning (which there is no explicit support for in the Hawn disclosure), there is no suggestion or motivation or other reason (other than hindsight of the present claims) to make the Bahten scrubbing brushes conductive. In addition, Applicant respectfully asserts that it cannot be assumed that it is even possible to make the Bahten scrubbing brushes conductive in the manner of Hawn. This is so because wafer cleaning requires cleaning members that do not damage the very fine and intricate microelectronics components of each integrated circuit aboard a wafer during cleaning. There simply is nothing in any of the references of record that discloses or suggests making a conductive wafer-cleaning brush that can perform without damaging the microelectronic components. Thus, it is Applicant's position that the present rejection could only be made in hindsight of the present claims.

For at least these reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Bahten/Hawn/Kitamura et al.

Claims 4 and 5 stand rejected under 35 U.S.C § 103(a) as being obvious in view of a combination of the Bahten patent, Hawn Bulletin and Kitamura et al. patent, each discussed above. Applicant respectfully disagrees.

As discussed above relative to the obviousness-type rejection in view of the Bahten/Hawn combination, Applicant believes that the Bahten/Hawn combination is improper relative to the claims from which claims 4 and 5 depend. The additional combination with the Kitamura et al. patent, in Applicant's view, does not remedy the shortcomings of the Bahten/Hawn combination, because it, too, like the Hawn Bulletin is directed to removing charges from xerography apparatus components in a field much different from wafer cleaning.

Consequently, it is Applicant's position that the Bahten/Hawn/Kitamura combination does not render claims 4 and 5 obvious.

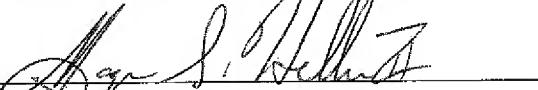
For at least this reason, Applicant respectfully requests that the Examiner withdraw the present rejection.

CONCLUSION

In view of the foregoing, Applicant submits that claims 2-5, 7, 10, 14, 17, 18 and 21, as amended, are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance is respectfully solicited. If any issues remain, the Examiner is encouraged to call the undersigned attorney at the number listed below.

Respectfully submitted,

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